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EXAMINER	
WOODS, ERIC V	

ART UNIT	PAPER NUMBER
2672	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/669,050	KATO ET AL.	
	Examiner	Art Unit	
	Eric V Woods	2672	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *24 September 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) _____ is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *24 September 2003* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *20041230*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Specification

2. The specification is objected to because it does not clearly identify the priority claims in the first section, e.g. according to Content of Specification section

> (b) Cross-References to Related Applications: See 37 CFR 1.78 and MPEP § 201.11.
>
> The specification does NOT have this section and instead has priority information in [0147]. Also, the incorporation-by-reference is technically improper, as **translated** copies of the certified priority documents have not been submitted. However, applicant should merely remove this statement – this is **NOT** a requirement for submission of translated copies of the certified foreign priority documents.

3. The disclosure is objected to because of the following informalities:

-Page 4, [0023], the term "Figure 6(b)" is misused – the item being described should be "Figure 6(d)" as described in the specification, and "Figure 6(b)" is previously enumerated in [0021].

Appropriate correction is required.

4. The specification purports to define "substantially cancels" and applicant is allowed to act as his own lexicographer if such definitions are clearly stated. However, the definition provided – "...refers to image shifting that appears to stabilize the image to the viewer..." is still indefinite [0034]. Applicant is required to provide a more quantitative measurement or standard by which one of ordinary skill in the art can

ascertain the metes and bounds of the claim (e.g. one of ordinary skill in the art would not know if the range in question was one to eighty relative degrees of vertical motion, horizon movements, only limited by the range of translation device, et cetera *ad infinitum*). Clearly, in the specification applicant's invention is directed to stabilizing a display over a given vibration frequency range (e.g. 0.2-3Hz, where $f < f_C$, and 3Hz-5Hz, e.g. $f > f_C$); thusly, applicant should use this kind of quantitative information as part of the definition for "substantially". Further, in the last paragraph of the specification, another definition for "substantially" is set forth [00146]. Applicant is required to move those definitions from the end of the specification to the beginning so that it is clear to the public (and to examiner) which definition of "substantially" is being utilized. Applicant is further required to remove one of the two definitions – either the one set forth in [00146] or the one in [0034]. Applicant is not allowed to set forth multiple, conflicting and mutually exclusive definitions of terms even though applicant is allowed to be applicant's own lexicographer. Finally, the definition of "substantially" set forth in [00146] still does not provide a standard for what percentage of motion would be canceled, as recited in those claims. [For purposes of the prior art rejections, examiner will use the definition set forth in [00146], but the rejection under 35 U.S.C. 112, second paragraph, will **not** be withdrawn without correction of the above specified errors.]

5. Further, the remaining definitions, e.g. [0143]—[0146] **must** be moved to the beginning of the application to fulfill applicant's requirement to put the public and the examiner on notice that applicant is redefining (and / or limiting) terms to specific definitions, as per applicant's legal obligation to do so.

6. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Drawings

7. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description:

A. Figures 1 and 2 do not contain element 100, a display device [0035].

B. Figure 1 lacks the recited elements 101, 102, and 103 [0036].

C. Figure 8 lacks recited elements S300, S310, S280, S290.

8. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description:

A. Figure 8 has elements S100, S110, S120, S130 not covered in the context of these features and obviously not intended to be repeats of the same features from Fig. 4.

9. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference characters "S100, S110, S120, S130" have been used to designate both critical steps in Fig. 4 and Fig. 8.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended

replacement-drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the examiner does not accept the changes, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

10. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> **The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter, which the applicant regards as his invention.**

11. Claims 3, 4, 7-8, 18, and 19 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The term "substantially" in claims 3, 4, and 18 is a relative term that renders the claim indefinite. The term "substantially" is not defined by the claim, the specification does not provide an accurate standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. The specification purports to define "substantially cancels" in the beginning of the Detailed Description section and applicant is allowed to act as his own lexicographer if such definitions are clearly stated. However, the definition provided – "...refers to image shifting that appears to stabilize the image to the viewer..." is still indefinite. Applicant is required to provide a more quantitative measurement or standard by which

one of ordinary skill in the art can ascertain the metes and bounds of the claim (e.g. one of ordinary skill in the art would not know if the range in question was one to eighty relative degrees of vertical motion, horizon movements, only limited by the range of translation device, et cetera *ad infinitum*). Neither the definitions recited in [00146] or [0043] or similar paragraphs provides a suitable standard. Also, note that applicant has multiple definitions of the term explicitly set forth in the specification.

The term "physique" in claims 7 and 8 is a relative term that renders the claim indefinite. The term "physique" is not defined by the claim, the specification does not provide an accurate standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. [Examiner will take the term to mean weight for purposes of rejecting the instant application over prior art for rejections under 35 U.S.C. 102(*) and 35 U.S.C. 103(a).]

Regarding claim 19, the word "means" is preceded by the word(s) "display" in an attempt to use a "means" clause to recite a claim element as a means for performing a specified function. However, applicant clearly specified in [0043-0044] that any combination of hardware or software could be utilized, and clearly some sort of hardware is physically required to enable software to display graphics. Amendment to the specification and / or claim(s) in question is required to make the means plus function language and recited definitions into compliance.

12. Claims 9-14 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential elements, such omission amounting to a gap between the elements. See MPEP § 2172.01. The omitted elements are: stating that the center

deviation cancellation is with respect to the original position of the display, not the translated position. Without this statement, the claim does not make sense, given that a display that operates with the recited system of claim 1 would not be operative under this claim, e.g. one cannot re-center a display that is being moved all of the claim to compensate for translational motion without further details.

Claims 10-14 are rejected for not correcting the deficiencies of their parent claim(s).

13. Claims 4-8 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for reciting "section configured and arranged to determine a passenger motion value indicative of a movement of a head portion of the passenger" where the specification clearly reflects in Fig. 1 as element 102 that such measurements are really made as approximations based on some kind of sensors embedded in the seat and based on posture information from sitting position, head position would be inferred [0035, 0038, 0039]. This is NOT what is being claimed, and as such renders the claim indefinite. Only one figure in the specification and a couple of paragraphs are directed to this limitation, and as such it is unclear which embodiment is being claimed.

The claims are also indefinite for claiming that sensors in the seat could reliably predict head position of the passenger. Claims 5-8 are rejected for not correcting the deficiencies of the parent claim.

Claim Rejections - 35 USC § 103

14. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

15. Claims 1-3, 9-14, and 16-20 are rejected under 35 U.S.C. 103(a) as being anticipated by Abali et al (US 6,317,114)('Abali'). [Claims 19 and 20 are merely slightly broader versions of claim 1, and the above rejection that reads on claim 1 clearly covers the limitations of these two claims, and thus the rejections valid for claim 1 are equally valid on those two claims without further comment.]

As to claims 1, 19, and 20,

A display device comprising:

-A display section configured and arranged to display an image within a display region of a non-head mounted display screen; (Abali Figs. 1 (element 10), 6A; col. 2:1-15)

-A motion detecting section configured and arranged to detect a movement of the display section; (2:1-55, particularly 2:25-30 and 2:40-50)

-An image displacement computing section configured to compute a translation displacement of the display section based on the movement of the display section; and (2:50-55, discussed more specifically in 6:5-60)

-Display control section configured to adjust a display position of the image within the display region of the display section based at least on the translational displacement of the display section. (2:1-55, particularly 2:50-55 and implemented in 6:5-60, particularly Fig. 2 where such a translation is shown).

Reference Abali clearly teaches all the limitations of the above claims as set forth in the above cited reference (e.g. this rejection would stand under 102(b), thus no

modification is required). It would have been obvious to modify Abali in any minor ways required to meet the above limitations.

As to claim 2,

The display device as recited in claim 1, wherein:

-The display section is configured and arranged to be fixedly coupled to a vehicle to display the image to a passenger inside the vehicle, and (6:58-65, 7:50-60, particularly the mention of the embodiment as applied to aircraft avionics, which are most assuredly "fixedly coupled" to a vehicle or airframe)

-The motion detecting section is further configured and arranged to detect the movement of the display section by detecting a movement of the vehicle. (6:58-65 and 7:50-60 again)

Reference Abali clearly teaches that his invention can be used in aircraft avionics, which clearly means that such systems are "fixedly coupled" to the vehicle. Further, Abali clearly discusses how the system compensates for vibration in an automobile (6:55-67) and naval ships and aircraft (7:50-60), which establishes that Abali is compensating for vibration and movement of the vehicle. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the system of Abali such that the display would be fixedly mounted to the vehicle and that the system compensate for the motion of such a vehicle, as is clearly established above that Abali was intended for such purposes.

As to claim 3,

The display device as recited in claim 2, wherein

-The display control section is further configured to shift the image by an amount that substantially cancels the translational displacement of the display section. (Examiner has already rejected this claim under 35 U.S.C. 112, second paragraph, for use of the term substantially).

Clearly, as established in the rejection to claim 2 above, the system cancels motion by the vehicle or underlying platform (Figs. 8A-8E show this process). Further, reference Abali clearly teaches this limitation (2:1-12), where the term "substantially" is used. Also, as is clearly covered in 6:45-67, translational motion is canceled. Therefore, reference Abali teaches all the limitations of the claim, and it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Abali to include the above-recited functionality if necessary, even though such functions are clearly taught by Abali and are inherent in the invention of Abali. Only the primary reference is utilized, so no separate motivation or combination is required.

As to claim 9,

The display device as recited in claim 2, further comprising

-A center deviation computing section configured and arranged to compute a center deviation between a center of the image and a center of the display region of the display section, (Fig. 3 clearly illustrates the shifting operation, and 4:20-40 discussed the procedure in detail, as well as 7:15-40, and for the Fig. 3 procedure to performed (e.g. re-centering), the center of both the display and of the translated image must *prima facie* be known, and if both are known, it is clear that the center deviation is also known)

-The display control section being further configured and arranged to display the image on the display section such that the center deviation is canceled. (Again, Fig. 3 clearly illustrates that the display device performs the recited function, and 4:20-40 teaches that such image is indeed displayed such that the center deviation is canceled.)

Reference Abali clearly teaches all the limitations of the above claim. Further, the system of Abali clearly performs the recited function – Abali terms it "re-centering".

Only the primary reference is utilized, so no separate motivation or combination is required.

As to claim 10,

The display device as recited in claim 9, wherein

-The center deviation computing section is further configured and arranged to set the center of the image using an average position of centers of a plurality of images consecutively displayed in the display section within a prescribed period of time and repeat computing the center deviation not faster than every three seconds.

Reference Abali clearly teaches in 4:15-40 that the re-centered display is allowed to shift back to its original position, over some user-specified time period between 1 and 10 seconds (see 4:35-40). This clearly establishes that the system is performing processing similar to that recited by applicant. Further, what applicant means by "average position of centers" is clearly a series of positions measured via the accelerometers, as there is no way to directly measure the center of the displayed image. Clearly, what applicant is claiming is that instead of one discrete measurement

being used to perform the centering operation, several are used (e.g. an average is taken).

Reference Abali is silent on the question of the number of measurements taken to perform the computation. It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the system of Abali to use multiple measurements so as to get an average, as this is well known in the art to help smooth out sudden spikes and eliminate or remove the influence of data outlier points. The V-displacement signal is clearly "shifting slowly" (7:15-30) which would match the limitations recited by applicant above (e.g., the slow shift and averaging technique recited).

As to claim 11,

The display device as recited in claim 9, further configured

-An acceleration/deceleration operation determining section configured and arranged to determine whether or not the vehicle is accelerating or decelerating,

-The center deviation section being further configured to stop computing the center deviation upon determining that the vehicle is accelerating or decelerating.

Reference Abali teaches this limitation – in the last section, 7:52-57, the anti-bias circuit is mentioned to compensate for constant acceleration. (See 7:15-30, that such measurements are taken) *Prima facie*, if there is a circuit to compensate for constant acceleration, the system must be aware of when acceleration begins and ends (the accelerometers clearly can provide this data). When under constant acceleration, the accelerometers would provide a constant output, which would then be compensated for

by the anti-bias circuitry, the point being that the display would remain shifted to one side even though this would be unnecessary otherwise. Given that an anti-bias circuit inherently pushes a system containing it back to the neutral or no-bias position (or removes the offset from constant acceleration), when such circuit is in operation (e.g. under periods of constant acceleration or deceleration), the system would clearly not be re-centering the image (at least, not by the amount of shift induced by the acceleration). As such, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify it to perform the recited limitations of the above claim if necessary.

As to claim 12,

The display device as recited in claim 11, wherein,

-The acceleration/deceleration operation determining section is further configured and arranged to determine whether the vehicle is accelerating or decelerating by detecting at least one of an accelerator pedal operation, a steering operation, and a vehicle motion.

This limitation is clearly taught by Abali. See the rejection to claim 11, where it is clearly established that the basis for determining the acceleration or deceleration was vehicular motion, which meets the above-recited limitation.

As to claim 13,

The display device as recited in claim 10, wherein

-An acceleration / deceleration operation determining section configured and arranged to determine whether the vehicle is accelerating or decelerating,

-The center deviation computing section being further configured and arranged to stop computing the center deviation when it is determined that the vehicle is accelerating or decelerating.

Reference Abali teaches this limitation – in the last section, 7:52-57, the anti-bias circuit is mentioned to compensate for constant acceleration. (See 7:15-30, that such measurements are taken) *Prima facie*, if there is a circuit to compensate for constant acceleration, the system must be aware of when acceleration begins and ends (the accelerometers clearly can provide this data). When under constant acceleration, the accelerometers would provide a constant output, which would then be compensated for by the anti-bias circuitry, the point being that the display would remain shifted to one side even though this would be unnecessary otherwise. Given that an anti-bias circuit inherently pushes a system containing it back to the neutral or no-bias position (or removes the offset from constant acceleration), when such circuit is in operation (e.g. under periods of constant acceleration or deceleration), the system would clearly not be re-centering the image (at least, not by the amount of shift induced by the acceleration). As such, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify it to perform the recited limitations of the above claim if necessary.

As to claim 14,

The display device as recited in claim 13, wherein

-The acceleration / deceleration operation determining section is further configured and arranged to determine whether the vehicle is accelerating or decelerating by detecting

at least one of an accelerator pedal operation, a steering operation, and a vehicle motion.

This limitation is clearly taught by Abali. See the rejection to claim 13, where it is clearly established that the basis for determining the acceleration or deceleration was vehicular motion, which meets the above-recited limitation.

As to claim 16,

The display device as recited in claim 1, further comprising

-A center deviation computing section configured and arranged to compute a center deviation between a center of the image and a center of the display region of the display section, (Fig. 3 clearly illustrates the shifting operation, and 4:20-40 discussed the procedure in detail, as well as 7:15-40, and for the Fig. 3 procedure to performed (e.g. re-centering), the center of both the display and of the translated image must *prima facie* be known, and if both are known, it is clear that the center deviation is also known)

-The display control section being further configured and arranged to display the image on the display section such that the center deviation is canceled. (Again, Fig. 3 clearly illustrates that the display device performs the recited function, and 4:20-40 teaches that such image is indeed displayed such that the center deviation is canceled.)

Reference Abali clearly teaches all the limitations of the above claim. Further, the system of Abali clearly performs the recited function – Abali terms it "re-centering".

Only the primary reference is utilized, so no separate motivation or combination is required.

As to claim 17,

The display device as recited in claim 1, wherein

-The display section, the motion detecting section, the image displacement computing section and display control section are configured and arranged to be part of a portable, hand held device.

Reference Abali clearly teaches this limitation, as in claims 1:15-30 various portable devices (laptop computers, personal digital assistants (PDA), et cetera) are taught and the invention is clearly directed at means of correcting vibrations for screens in vehicles, etc., and clearly it is reasonable that such devices be portable, as this is how Abali opens his disclosure – that this a problem that he aims to correct. Clearly, it would be obvious to have all the components in one portable, hand-held device, as the invention of Abali is very small (comparatively, if MEMS accelerometers and some kind of ASIC or IC is used, such a device could be easily fit on a piece of silicon $4mm^2$ or smaller, as a typical MEMS accelerometer is approximately these dimensions and digital circuitry of the type required here requires negligible die space (a few amplifiers, registers, et cetera) at current process geometries or even at 0.5μ m, as it is primarily utilizing the existing display circuitry (note 6:25-40), which would clearly fit inside a handheld device).

As to claim 18,

The display device recited in claim 17, wherein

-The display control section is further configured to shift the image by an amount that substantially cancels the translational displacement of the display screen.

Clearly, as established in the rejection to claim 17 above, the system cancels motion detected (Figs. 7A-7E and 8A-8E show this process). Further, reference Abali clearly teaches this limitation (2:1-12), where the term "substantially" is used. Also, as is clearly covered in 6:45-67, translational motion is canceled. Therefore, reference Abali teaches all the limitations of the claim, and it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Abali to include the above-recited functionality if necessary, even though such functions are clearly taught by Abali and are inherent in the invention of Abali. Only the primary reference is utilized, so no separate motivation or combination is required.

16. Claims 4-6 are rejected under 35 U.S.C. 103(a) as unpatentable over Abali in view of Parker et al (US PGPub 2002/0099257)('Parker').

As to claim 4,

The display device as recited in claim 2, further comprising

-A passenger motion determining section configured and arranged to determine a passenger motion value indicative of a head portion of the passenger, and (Parker [0065])

-A relative displacement computing section configured to compute a relative displacement between the display section and the head portion of the passenger based on the translational displacement of the display section computed by the image displacement computing section and the passenger motion value of the head portion of the passenger determined by the passenger motion determining section, (Parker [0050-0052, 0061-0062, 0065])

-The display control section being further configured and arranged to shift the image displayed in the display section by an amount that substantially cancels the relative displacement. (Clearly, as established in the rejection to claim 2 for example, the system cancels motion by the vehicle or underlying platform (Figs. 8A-8E show this process). Further, reference Abali clearly teaches this limitation (2:1-12), where the term "substantially" is used with respect to translational motion cancellation. Also, as is clearly covered in 6:45-67, translational motion is canceled.)

Clearly, reference Abali does not expressly teach the use of a head-tracking system. However, reference Parker, which is analogous art (e.g. the system of Parker is directed to canceling feelings of motion sickness caused by vibration and movements), clearly uses head-mounted systems as cited above. Given that the two systems are analogous art (and reference Parker can also be used with head-mounted displays [0063-0065] – however, note that Parker is not **limited** to head-mounted displays, and thus is perfectly valid (see MPEP 2123) in this case, and can be combined with the system of Abali and does **not** render the combination nonfunctional), the combination makes sense – with head-based tracking, the system would be more versatile and more accurate and would account for instances where users were looking at angles that were not directly at the display. It would have been obvious to one having ordinary skill in the art at the time the invention was made to combine the systems of Parker and Abali as set forth above to create a system that, as cited above, could perform head tracking to prevent motion sickness ([0002-0005, 0065] Parker), which is also a stated goal of applicant.

As to claim 5,

The display device as recited in claim 4, further comprising

-A head motion detecting section configured and arranged to detect the movement of the head portion of the passenger, (Parker [0065])

-The passenger motion determining section being further configured and arranged to determine the passenger motion value based on a detection result from the head motion detecting section. (Parker [0050-0052, 0061-0062, 0065])

Clearly, as established above in the rejection to claim 4 above, reference Abali does not expressly teach these limitations. However, Parker clearly teaches head tracking as established above, and *prima facie* the system of Parker would take the input and utilize it, e.g. would feed the results to the system of Abali. It would have been obvious to one having ordinary skill in the art at the time the invention was made to combine the systems of Parker and Abali as set forth above to create a system that, as cited above, could perform head tracking to prevent motion sickness ([0002-0005, 0065] Parker), which is also a stated goal of applicant.

As to claim 6,

The display device as recited in claim 4, wherein

-The passenger motion determining section is further configured and arranged to determine the passenger motion value based on at least one of a response function of vibration of a human body corresponding to the passenger in response to the movement of the vehicle and a numerical model indicative of the vibration of the human body in response to the movement of the vehicle.

Clearly, as established above in the rejection to claim 4 above, reference Abali does not expressly teach these limitations. However, Parker clearly teaches head tracking as established above, and *prima facie* the system of Parker would take the input and utilize it, e.g. would feed the results to the system of Abali. Clearly, the system of Parker also uses a numerical model of how human beings respond to the vibration of the human body to prevent motion sickness (Parker [0010] and [0015].) It would have been obvious to one having ordinary skill in the art at the time the invention was made to combine the systems of Parker and Abali as set forth above to create a system that, as cited above, could perform head tracking to prevent motion sickness ([0002-0005, 0065] Parker), which is also a stated goal of applicant.

17. Claim 15 is rejected under 35 U.S.C. 103(a) as unpatentable over Abali in view of Okazaki et al (US 5,691,471)('Okazaki').

As to claim 15,

The display device as recited in claim 2, further comprising

-An acceleration/deceleration operation determining section configured and arranged to determine whether the vehicle is accelerating or decelerating, (Reference Abali teaches this limitation – in the last section, 7:52-57, the anti-bias circuit is mentioned to compensate for constant acceleration. (See 7:15-30, that such measurements are taken) *Prima facie*, if there is a circuit to compensate for constant acceleration, the system must be aware of when acceleration begins and ends (the accelerometers clearly can provide this data). When under constant acceleration, the accelerometers would provide a constant output, which would then be compensated for by the anti-bias

circuitry, the point being that the display would remain shifted to one side even though this would be unnecessary otherwise. Given that an anti-bias circuit inherently pushes a system containing it back to the neutral or no-bias position (or removes the offset from constant acceleration), when such circuit is in operation (e.g. under periods of constant acceleration or deceleration), the system would clearly not be re-centering the image (at least, not by the amount of shift induced by the acceleration). Finally, Abali uses accelerometers (2:25-30).)(Reference Okazaki is an accelerometer)

-The image displacement computing section being further configured to compute the translational displacement divided into a low frequency displacement, which is not detectable by the passenger when the vehicle travels at a constant speed, and a high frequency displacement which is detectable by the passenger when the vehicle travels at a constant speed, (As stated, in Abali 7:52-57, clearly the acceleration is one component of the signal detected by the accelerometer and vibration is another – that is, low and high frequency components.)(Reference Okazaki clearly teaches (3:35-45) that the accelerometer's circuitry calculates a low frequency component and a high frequency component. It is well known in accelerometers that low frequency components and high frequency components represent different components of acceleration or noticeable vibrations. Thusly, the Okazaki patent (1:5-45 and 2:5-45) clearly teaches that accelerometers can perform this functionality, and the Okazaki patent does (3:5-30).)

-The display control section being further configured to adjust the display position of the image within the display region of the display section based on the low frequency

displacement and the high frequency displacement when the vehicle is accelerating or decelerating and based on the high frequency displacement when the vehicle is not accelerating or decelerating. (The constant acceleration components would damped out by the anti-bias circuit of Abali when needed, which would cause the system to ignore the low frequency components whilst the system is not accelerating, and would cause it to take them into account whilst it is.)

Thusly, reference Abali does not explicitly teach all of these limitations, but as defined immediately above does teach that vibration and acceleration components (the high and low frequencies of Okazaki) are detected by accelerometers, and that some of such components can be selectively filtered out (anti-bias circuit of Abali and low-pass filter of Okazaki (10:58-67, 11:1-30)). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to combine the vibration-compensating display of Abali with the accelerometers of Okazaki, as Abali uses accelerometers and filtering, and Okazaki provides on-chip filtering and signal conditioning circuitry, and it would have been obvious to modify the device of Abali to filter as set forth in the above claim in order to damp out low-frequency vibrations that the passenger would not notice while the vehicle was operating under a constant speed, etc.

Allowable Subject Matter

Claims 7 and 8 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

The following is an examiner's statement of reasons for allowance of the above claims: prior art systems exist that compensate non-head mounted displays for movement and vibration (Abali) and use human-based models of processing to alleviate motion sickness from vibration-like effects of on people (Parker) using accelerometers that are head-mounted (Parker) or not (Abali) similar to Okazaki that filter high- and low-frequency components. However, systems that estimate and make such changes based on physique or weight measurements per se are not known and appear to be a relatively novel variation.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Eric V Woods whose telephone number is 703-305-0263. The examiner can normally be reached on M-F 7:30-5:00 alternate Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Razavi can be reached on 703-305-4713. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Eric Woods

January 03, 2005

JEFFREY BRIER
PRIMARY EXAMINER